Reflecting on the History and Use of Rectangular Obsidian "Mirrors" from Mexico: Reinterpreting Old Museum Collections and Indigenous–Colonial Intersections

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INTRODUCTION

Over the past two decades researchers have increasingly used museum collections as primary sources for gaining a deeper understanding of socioeconomic processes of the past both independently of and in comparison to newly excavated archaeological material (Voss, 2012; Flexner, 2016a; Frieman and Janz, 2018; King, 2016; Childs and Warner, 2019). For example, recent studies of rectangular polished obsidian items, typically found within museum collections, have indicated that these objects were made by Mexican Indigenous artisans during the colonial period for European consumption. Nevertheless, much of this research was not well-grounded within the discipline of anthropology and therefore did not fully address the potential cultures or communities that manufactured these items and the Indigenous and colonial intersections under which they were produced and consumed. Additionally, many museums continue to categorize these objects as pre-Columbian mirrors and vaguely assign them to cultures of Mesoamerica.

For the current study, we initiated an obsidian "mirrors" collections-based research project at the Smithsonian Institution's National Museum of the American Indian (NMAI), which to our knowledge houses the largest collection (n = 6) of highly polished, rectangular obsidian tablets. We examined all six of the objects that are commonly classified as mirrors because of their highly reflective surfaces (Mason, 1927; Ekholm, 1973). To date no such objects have been recovered from a secure archaeological context (pre-Hispanic or colonial; Smith, 2014:13).

This research takes an ethnohistorical as well as a historical archaeology approach (see Lightfoot, 1995; Palka, 2009; Strong, 2015; Silliman, 2020) interweaving museum collections with pre-Columbian archaeological studies, Mesoamerican art and iconography, and historical sources[1] to explore the history and use of rectangular obsidian mirrors in the context of colonial entanglements in Mexico. Spain's imperial expansion into the Americas, considered one of the largest ever known in the Western Hemisphere, was as a process of geographic expansion, mercantilism, and capitalism within the modern world (Orser, 1996), one that operated on "fixed orders of racial and cultural difference" (Gosden, 2004:22). Coloniality consisted of "an invasion, a colonization effort, a social experiment, a religious crusade, and a highly economic enterprise" (Deagan, 2003:3). According to Quijano (2007:169),

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> In the beginning colonialism was a product of a systematic repression, not only of the specific beliefs, ideas, images, symbols or knowledge that were not useful to global colonial domination, while at the same time the colonizers were expropriating from the colonized their knowledge, specially in mining, agriculture, engineering, as well as their products and their work.

It is within the context of a Euro-centered colonialism—defined as a centralized government and economy controlled by the crown and monolithic Catholicism—that we explore the manufacture and use of obsidian tablets. More specifically, we investigate the socioeconomic relations between Indigenous communities in Mexico and Spanish colonizers to explore whether crafting communities operated with economic agency in these colonial situations, that is to say, if, and to what degree, Native artisans were able to exert their autonomy under the colonial rule, for example, within *encomiendas* (grant of tribute-paying subjects), imperial tribute systems, or a market economy or perhaps as independent artisans.

Additionally, we subscribe to and will add to the body of literature that disputes the colonial/Eurocentric "model of quick replacement," the notion that more sophisticated European technologies immediately replaced autochthonous ones (see Rogers 1988, 1990; Pastrana and Fournier 1998; Rodríguez-Alegría, 2005, 2008, 2014). This study illustrates how Native knowledge and technology persisted through the colonial invasion but were employed to produce objects for European elites and artists. For example, feather works and polished obsidian objects, which represent some of the most sumptuous items and required Indigenous ingenuity, technique, artistry, aesthetics, and local materials, were intended for elite European consumption and appropriation (see Feest, 1990; Meslay, 2001; Pixley, 2012).

The objects used for this study made their way into the NMAI through purchases from collectors, through early twentieth century anthropologists, and through exchanges between museums without much additional museum provenance, that is, "all associations of an artifact with individuals, collections, and institutions from the time of its discovery" (Flexner, 2016b:169). Additionally, fine-grained provenience documentation, for example, the location or coordinates of an object found during excavation or excavation notes, is nonexistent (see Barker, 2012; Flexner, 2016b). This lack of information shrouds their function, chronology, and precise cultural assignment, and in museums they are broadly identified as pre-Columbian mirrors from Mesoamerica.

According to the NMAI's museum records, the investigated items are listed as "rectangular obsidian mirrors" (see Table 1, Figure 1), and their provenience is noted as the modern-day state of Michoacán, Mexico, and the Valley of Mexico. These locations correspond to the homeland of the Purépecha[2] (CE 1350–1522 [Common Era, formerly denoted AD]) and Aztec[3] (CE 1325–1521) empires (Gorenstein and Pollard, 1983; Pollard, 2008; Berdan, 2017); therefore, we will use this museum provenience data as a starting point and place our focus on the organization of Purépecha and Aztec craft production prior to and under Spanish rule. Consequently, locating the raw material sources of the obsidian items under investigation through provenance studies is necessary to further explore and understand the development of socioeconomic relations between artisans who produced high-valued prestige items and the colonial structures of the Spanish invasion. Material sourcing allowed us to place the artisan communities within the greater cultural context of the Purépecha and/or Aztec Empires. The pre-Columbian archaeological record indicates that the Aztec and Purépecha Empires were warring polities; however, the Purépecha Empire was never subjugated by the Aztecs (Gorenstein and Pollard, 1983:1; Berdan, 2017). Because each polity had access to multiple obsidian sources within their territories, there was little obsidian exchange between the two (see Pollard and Smith, 2003; Hirth et al., 2006; Golitko and Feinman, 2015). Although we must take into account that traditional trade routes were disrupted and that European draft animals, wheeled carts, and a newly built road system were introduced after the Spanish conquest (Hassig, 1985:187–219; see also Rodríguez-Alegría et al., 2013; Pastrana Cruz et al., 2019), obsidian production remained fairly localized in its nature, and tracing the provenance of the objects under investigation allowed us to locate the specific city-state that produced these items.

MIRRORS AND RECTANGULAR, POLISHED OBSIDIAN TABLETS FROM MESOAMERICA

The manufacture of obsidian mirrors and other polished precious stone objects falls under the term "lapidary technologies" (Charlton et al., 1991; Otis Charlton, 1993). Because the items under investigation show elements of pre-Columbian crafting traditions, we provide an overview of the development and use of mirrors and polished obsidian tablets in Mesoamerica.

In Mesoamerica, the first mirrors were recorded at the Middle Preclassic Period (1200–400 BCE [Before Common Era]) site of La Venta, Mexico (Gallaga, 2018:16). Mirrors in Mesoamerica are made from a variety of ores (Carlson, 1981:120; Heizer and Gullberg, 1981:114; Blainey, 2007) and knapped and polished obsidian (Taube, 1992:31–34; Reents-Budet, 1994:322). Hematite was most commonly used in the Preclassic periods (2000 BCE–CE 250), pyrite was used most in the Classic period (CE 250–900), and obsidian was the material of choice during Postclassic times (Ekholm, 1973; Gallaga, 2001, 2009, 2018). It is suggested that mirrors and other mirroring surfaces were used for vanity in domestic contexts; however, "due to their capacity for projecting an inverse reflection of the spectator's reality, mirrors were used as divinatory or magical portals to communicate between parallel dimensions, worlds, or realities" by royal elites and shamans (Gallaga, 2018:4).

Mirrors were also worn as part of military dress in pre-Columbian Aztec society (Pastrana and Carballo, 2016). They embodied or served as religious accoutrements of Aztec and Maya

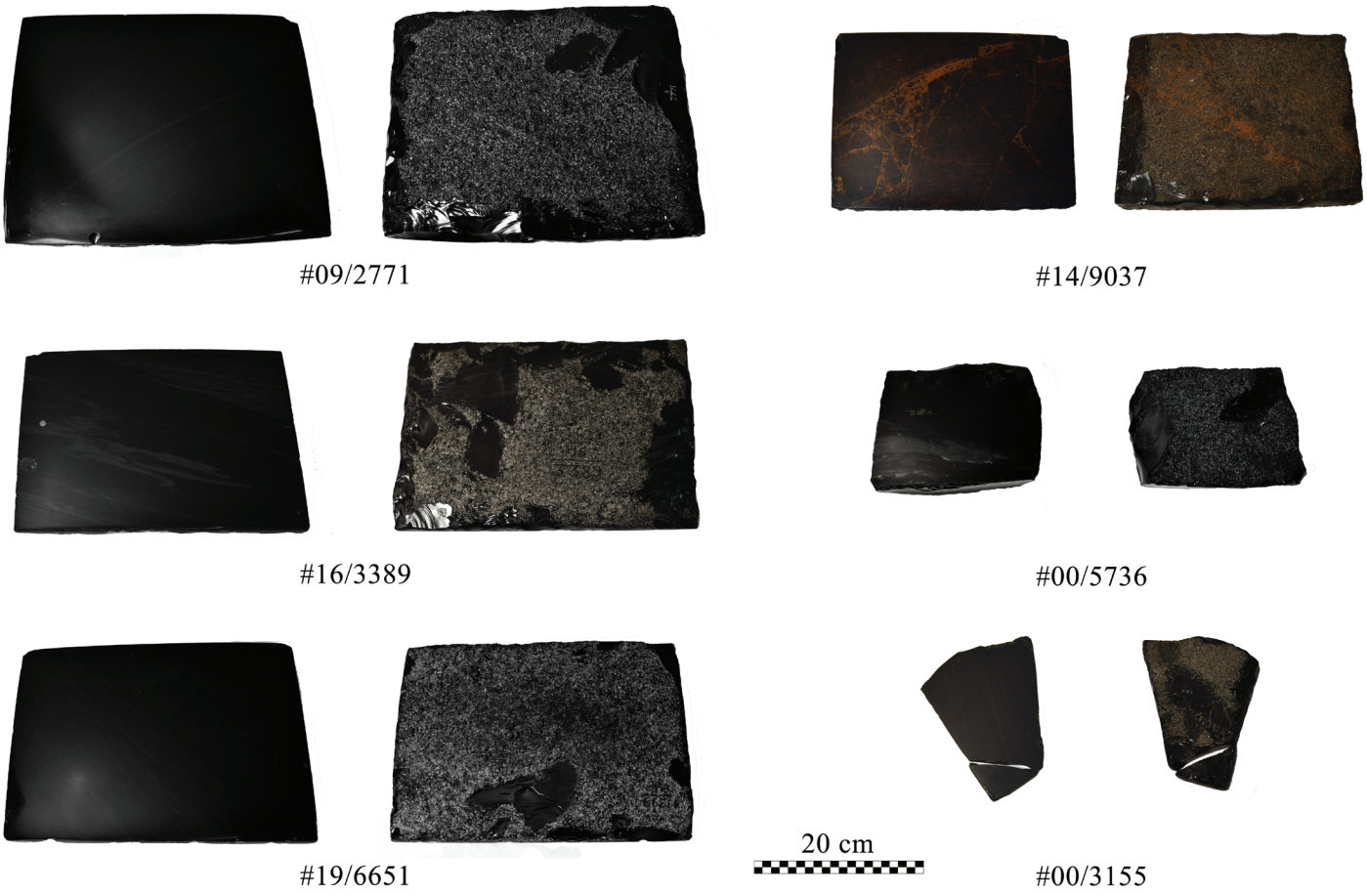

FIGURE 1. Six rectangular, polished obsidian tablets, identified by their NMAI catalog numbers.

gods. For example, iconographic representations of Tezcatlipoca (Lord of the Smoking Mirror) with his right foot replaced by a round obsidian mirror are present on various mediums, including murals, ceramic vessels, and codices, throughout central Mexico and beyond (Olivier, 2003; Smith, 2014; Umberger, 2014). According to Smith (2014:15), images of rectangular obsidian mirrors are not found in the Aztec codices. Additionally, the pre-Hispanic archaeological evidence indicates that mirrors in Purépecha society were also round rather than square (Rebnegger, 2013). In the Maya region, Classic period (CE 250–900) polychrome vessels portray courtly scenes of rulers, members of the court, and various deities using mirrors for scrying and divinatory rituals.[4] There, however, items identified as mirrors from sound archaeological context are always made of iron ore (Inomata et al., 2002; Blainey, 2007, 2018; Healy and Blainey, 2011), and to our knowledge, there is no evidence of rectangular obsidian mirrors in the Lowland Maya region during Postclassic times (CE 900–1530) either. Therefore, we can exclude the possibility that rectangular, polished obsidian tablets were made or used by the Maya, and we can exclude that they were used by pre-Columbian Purépecha or Aztec peoples.

Consequently, recent research indicates the items we consulted (rectangular, polished obsidian tablets) are not pre-Hispanic and to our knowledge were not used by the Native peoples who manufactured them. Rather, they are likely colonial period objects consumed by the Spanish (Saunders, 1997; Meslay, 2001; Evans, 2010; Pixley, 2012) and manufactured by Mesoamerican lapidarians (Calligaro et al., 2007:48). McAndrew (1965:379) has documented the presence of a rectangular, polished obsidian item serving as the main altar at San Jose de los Naturales, the atrio of San Francisco in Mexico City in CE 1564. An ethnohistoric source additionally noted that square obsidian altars were made by Native obsidian craftspeople and commissioned by Franciscan fathers Alonso Ponce and Juan de Torquemada in the state of Michoacán (see Evans, 2010:76–77; Torquemada, [1615] 1943:210). Francisco Hernández, a medical doctor in the 1570s, documented Indigenous remedies throughout New Spain (Bye and Linares, 1990). He noted the use of *Iztli* (obsidian in the Nahuatl language) for the production of *aras* (altars) used by the Spanish, which were held in high esteem because of their reflecting properties (Hernández, 1959). By the seventeenth century, polished, rectangular obsidian items were also being used as

canvases by Baroque period artists, most notably Spanish master Bartolomé Esteban Murillo (CE 1617–1682; Meslay, 2001; Calligaro et al., 2005, 2007; Pixley, 2012).

Nevertheless, some museums assign their context to tombs (The University of Pennsylvania Museum of Archaeology and Anthropology; Musée du quai Branly – Jacques Chirac), date individual specimens as early as 1500–1400 BCE (Corning Museum of Glass), and note their origin as Central America and Mexico. Frequently, museums assign obsidian mirrors with Mexican provenience to the paramount Aztec god Tezcatlipoca (Lord of the Smoking Mirror), one of the most revered deities of their pantheon (Saunders, 1997, 2001; Baquedano, 2014; Smith, 2014). However, as follows from the discussion above, we will work under the supposition that these items were novelties of the Spanish invasion of present-day Mexico, which started in 1521, and ascribe their manufacture to Purépecha and/or Aztec craftspeople. This background informed the working hypothesis for this study.

Although these previous studies revealed a certain degree of insight concerning rectangular obsidian tablets, such objects have not been assigned to a particular cultural group in Mesoamerica, and to date, no in-depth technological analysis has been published. Smith (2014) has recognized that the most appropriate approach to determine the function and cultural assignment of such obsidian objects is through technomorphological studies in tandem with material provenance analyses. Therefore, for this study we conducted macro- and microscopic manufacture trace investigations combined with portable X-ray fluorescence spectrometry (pXRF) analysis for raw material provenance.

MATERIALS AND METHODS

Objects and Museum Provenance

The collections currently under the stewardship of the NMAI were transferred from the Museum of the American Indian, Heye Foundation to the Smithsonian Institution in 1989 under the federal legislation known as the National Museum of the American Indian Act. George Gustave Heye began collecting Native American and Indigenous items from throughout the Americas in 1897. By 1916, his collection contained more than 58,000 items, and he established the Museum of the American Indian, Heye Foundation in New York. Although George Gustave Heye consulted with many professional anthropologists, most notably Franz Boas, much of the collection was amassed through purchases from untrained collectors and amateur anthropologists (see Jacknis, 2008). Therefore, contextual data can be inaccurate, meager, and sometimes nonexistent. His collecting practices are part of what has been termed the "collection frenzy" (Bench, 2014:57) during the founding of most large natural history museums, also referred to as the Museum Period, 1860–1900 (Fenton, 1960:330). Many believed that the effects of colonization would soon cause the demise of all Native and Indigenous peoples and their traditional lifeways, prompting museums and anthropologists to begin their frenetic collection programs (e.g., Bell, 2017). Therefore, we must acknowledge and never forget that many of the items and much of the documentation acquired by museums were collected under social, political, and economic duress and sometimes through illicit activities.

The six items we selected for this project are identified as obsidian mirrors from the Valley of Mexico and Michoacán, Mexico. Our initial examination confirms the material is obsidian. All six items are identified as archaeological in the NMAI catalog, but no records exist indicating their contexts except for item 09/2771, which was assigned to a specific culture and chronological context by NMAI curators in the course of an exhibition (*Great Masters of Mexican Folk Art from the Collection of Formento Cultural Banamex, A.C.*, 2002–2003, National Museum of the American Indian George Gustave Heye Center, New York; see Table 1). Two of the items (NMAI 00/3155 and 00/5736) were on loan and exhibited at The University of Pennsylvania Museum of Archaeology and Anthropology from 1909 to 1917. Two, NMAI 14/9037 and 19/6651, were on exhibit at the Museum of the American Indian but were taken off exhibit in 1941 for fear of air strikes when America entered World War II. Additionally, NMAI 09/2771, 00/3155, 16/3389, and 19/6651 have associated accession records, but not much information beyond that exists for these items. As is apparent from Table 1, most of these objects came to the NMAI through collectors or exchange with other museums, which does not provide more detailed information concerning their Indigenous history (see Turner, 2015, 2020). Since the results of studying the practices and collection history of the collectors and the one ethnographer (Carl Lumholtz) did not promise to provide crucial information for answering our primary questions concerning the artisans and their roles after the Spanish conquest, we decided not to follow this line of investigation beyond the available museum records.

Methods

Technomorphological Analyses

The obsidian tablets were investigated through a multiscalar optical approach for the identification and documentation of manufacturing traces. We used macroscopic examination, as well as stereo- and digital microscopy. Macroscopic investigation confirmed the general "internal stratigraphy" of manufacture, allowing for a reconstruction of the *chaîne opératoire* from basic shaping to the final design of the polished objects. For stereomicroscopy, we used a Zeiss reflected light microscope, and digital microscopic documentation was performed with a AF4515ZT-Wired Dino-Lite Edge. The latter produced photomicrographs of characteristic manufacturing traces under various magnifications, providing in-depth information about specific tools used in each production step.

TABLE 1. Description and museum provenance for objects cataloged in the Smithsonian Institution's National Museum of the American Indian (NMAI).

NMAI catalog no.	Object description	Museum provenance
09/2771	Large rectangular obsidian mirror; 40.9 × 32.3 × 2.93 cm; 8.4 kg	Mexico; Michoacán State; Pátzcuaro Municipality, Purépecha, CE 1000–1521; Henry Hurlburt Rice Collection, purchased in 1919
16/3389	Large rectangular obsidian mirror; 34.5 × 24.8 × 2.68 cm; 4.4 kg	Valley of Mexico, Leo Stein Collections, purchased in 1928 from Basel, Switzerland
19/6651	Rectangular obsidian mirror; 28.7 × 36.2 × 2.83 cm; 5.6 kg	Valley of Mexico; exchange with Cranmore Ethnographical Museum in 1937
00/5736	Obsidian mirror; 20.8 × 15.53 × 3.5 cm; 2 kg	Mexico; Michoacán State, Pátzcuaro; collected by Carl Lumholtz in 1905
00/3155	Obsidian mirror fragment; 19 × 15 × 2 cm; 1 kg	Valley of Mexico; Henry Booth Collection, purchased in 1905
14/9037	Square mahogany obsidian mirror; 26.5 × 19.9 × 2.96; 3 kg	Valley of Mexico; purchased in 1926

Raw Material Provenance Analyses

Given the high sensitivity of archaeological museum collections, nondestructive and at the same time reliable techniques are required for their scientific investigation. One promising method meeting these requirements is pXRF. Since the detection limits of newer generations of pXRF detectors have been significantly improved over the past decade, analytical results have become more comparable to laboratory-based XRF, specifically with regard to X-ray lines with energies from ~6 to 19 keV (Craig et al., 2007; Shugar and Mass, 2013). Especially for obsidian, the suitability of pXRF for tracing archaeological artifacts back to their sources has convincingly been demonstrated, making this technique the method of choice for museum-based research endeavors. Additionally, such research holds the potential to expand the general database of archaeological provenance studies by making otherwise inaccessible datasets available for research (e.g., Forster and Grave, 2011; Millhauser et al., 2011; Frahm, 2014).

For Mesoamerican obsidian provenance studies, pXRF has also been successfully applied, and the most important sources have been characterized (e.g., Millhauser et al., 2011; Moholy-Nagy et al., 2013; Ebert et al., 2015). Archaeological and provenance studies demonstrate that obsidian was omnipresent in pre-Hispanic Mesoamerica and was traded and used by both small- and large-scale societies for a variety of purposes for more than 10,000 years (Gaxiola and Clark, 1989; Saunders, 2001; Cobean, 2002; Hirth and Andrews, 2002; Hirth, 2006; Pastrana Cruz et al., 2019). Various studies involving geochemical and visual analyses have identified the sources of obsidian artifacts throughout central Mexico and the Guatemalan and Honduran highlands and have provided indications of the crafting communities using those sources (e.g., Darras, 1994, 2008, 2009; Glascock et al., 1998; Braswell et al., 2000; Cobean, 2002; Glascock, 2002; Healan 2002, 2009).

The six rectangular obsidian tablets from the NMAI were analyzed using a Bruker ELIO pXRF in atmosphere with a polychromatic Rh X-ray source and a 50 mm^2 silicon drift detector. Multiple point spectra were acquired for each specimen at operating conditions of 50 kV and 75 μA and with a 240 s real-time acquisition. K_α X-ray line intensities for Mn, Fe, Rb, Sr, Y, Zr, and Nb were measured and processed using Bruker Esprit (version 2.1) software after an energy shift correction was applied. Peak intensities were background corrected and deconvolved to account for overlapping peaks to obtain a net count inventory for each of the seven elements. Net count ratios for five element pairs (Rb/Zr, Sr/Zr, Y/Zr, Nb/Zr, and Fe/Mn) were compared to reference obsidians from four archaeologically

relevant obsidian deposits in central Mexico. To provide a regional sourcing comparison, seven polished reference standards from these four obsidian flows were also measured using the ELIO pXRF under conditions identical to those used to collect spectra from the obsidian tablets. Three samples were supplied by Michael Glascock of the University of Missouri Research Reactor (MURR; Cobean, 2002), one specimen was supplied by Dan Healan (DH Ucareo; Healan, 1997), and three samples were provided on loan from the National Museum of Natural History's (NMNH) National Rock and Ore Collection (Robert Smith obsidian collection). These samples encompass archeological obsidian sources from the Pachuca (Sierra de Las Navajas), Otumba, Ucareo, and Zinapécuaro areas (see Figure 5 for a map). One final obsidian reference specimen, NMNH 72854/VG-568, from Obsidian Cliff in Yellowstone National Park, was measured during each analytical session to determine the accuracy and precision of the instrument throughout the period of the project. The Yellowstone obsidian used here is part of the Smithsonian Microbeam Standards collection, and as such its major and minor elemental composition has been well characterized by wet chemical methods and electron microprobe analysis (Jarosewich et al., 1990). Source plots of element ratios were made by computing 95% reliability ellipses for the reference samples (where 95% of the values from the source references plot within the ellipse) with JMP statistical software from SAS, using a method similar to that of Stroth et al. (2019). Source assignments were determined by comparing the net count ratios from the tablets to the source plots. To further determine the validity of the biplot method using XRF net counts, the elemental ratios determined from the net counts for the obsidian standards were compared to elemental ratios from previous analyses in the literature, encompassing data collected by instrumental neutron activation analysis (Cobean, 2002; Glascock, 2011), XRF (Healan, 1997; Glascock, 2011; Millhauser et al., 2015), and laser ablation–inductively coupled plasma–mass spectrometry (Carballo et al., 2007). The net count ratios reported here are in good agreement with elemental ratios published previously.

Results

Technomorphological Analyses

Generally, all sides of the objects were investigated, and the working traces were documented. The anatomical terms for obsidian tablets are provided in Figure 2 (after Wright, 1992). Object NMAI 00/5736 is a fragment, and only the original upper and lower sides are preserved; therefore, we did not include the edges in the analyses. Similarly, for object 00/3155 only the original edges were analyzed. During the first step of production of all objects in this study, rough shaping was applied to produce a rectangular tablet. All sides were worked mainly by direct soft percussion flaking with additional pressure flaking for the edges when needed. Large thinning flakes were removed from the lower and most likely upper sides to create extensive multifaceted surfaces. The upper sides were polished to such a high degree that all previous traces of manufacture were completely erased. The second reduction strategy consisted of systematic pecking of protruding ridges resulting from the flake scars (Figure 3a). It can be observed predominately on the flat lower sides of all specimens and partly on some edges. All except two pieces show medium to coarse pecking marks and embedded Hertzian cones; however, objects 14/9037 (mahogany) and 00/3155 (fragment) display finer pecking scars (perhaps from different tools and/or techniques). For most specimens, the individual pecking marks measure approximately 2 mm in diameter (Figure 3b,c), whereas for 14/9037 the diameter is only slightly greater than 0.5 mm. Healan (2009:104) describes various tools producing such impact marks for working platforms of prismatic obsidian cores at Tula and Xochicalco and the Villafuerte workshop at the Ucareo source. He lists small, pointed chert pebbles, flakes, or bifaces as well as soft hammerstones as most likely tools.The third stage of production involved grinding, predominately on the edges. We conducted experiments to gain comparable manufacturing traces from known lapidary tools. These tools consisted of a quartzite grinding stone, a gneiss grinding plate, a coarse metal file, and a sandstone grinding wheel. The latter was a commonly used tool in postmedieval European lapidary, especially for hard rocks, such as gemstones. The traces observed on the edges of the obsidian plates (e.g., Figure 3d,e) correspond best to

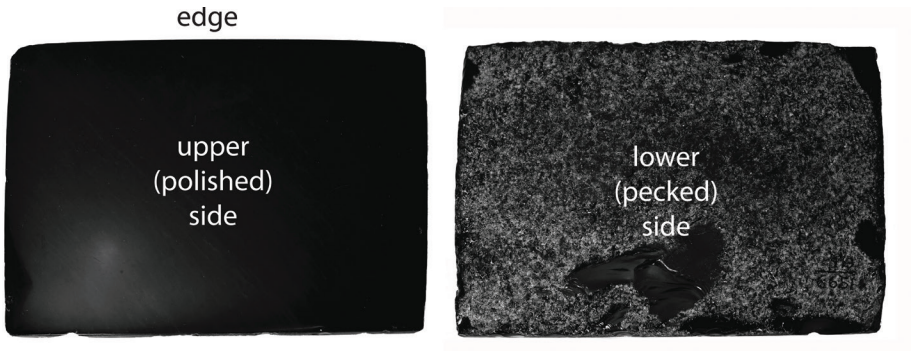

FIGURE 2. Obsidian tablet morphology, NMAI 19/6651.

the experimental traces produced by the grinding wheel (Figure 3f). Polishing traces on the upper sides are microscopically visible on all objects except for one. Object 16/3389 was polished to a degree that all traces were removed (Figure 3i). Objects NMAI 00/3155, 00/5736, and 09/2771 show remaining polishing traces, item 14/9037 (mahogany tablet) has extensive fine striations (Figure 3h), and object 19/6651 has abundant fine bundles of striae covering the entire surface (Figure 3g). It appears that the six tablets fall into two separate groups based on different tool traces. Objects 16/3389 and 19/6651 are strikingly similar in all aspects of manufacture except for the final polishing; perhaps more time was invested in the production of the former. Objects 00/5736 and 09/2771 fit into the same extending group, whereas items 14/9037 and 00/3155 differ because of their finer pecking patterns on the lower sides. Therefore, it is possible that these objects come from two different workshops or schools of practice using different tools and techniques or from two different artisans. Another possibility is that these items were manufactured over a period of more than 100 years, and the technology used to manufacture them may have changed over time.

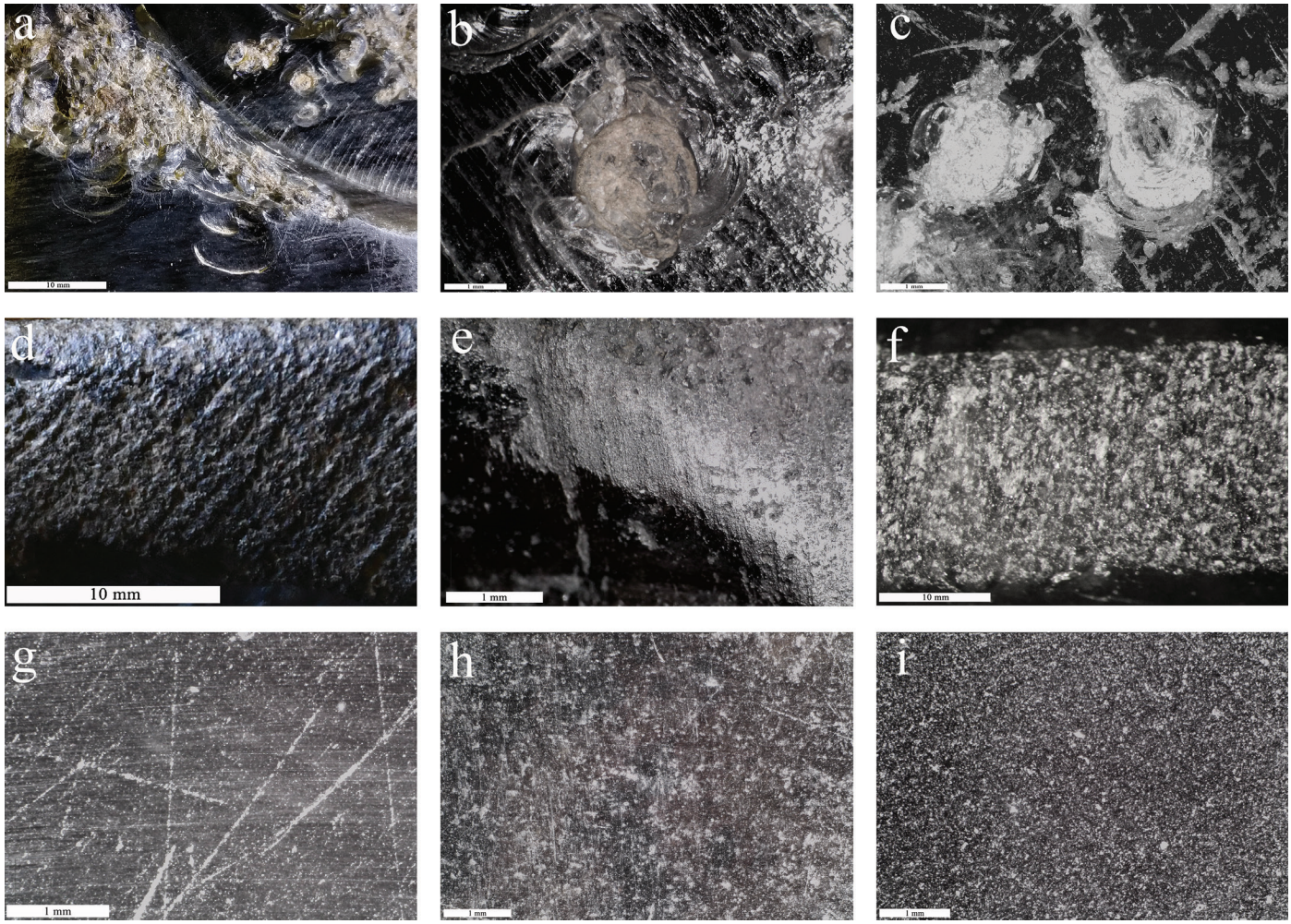

FIGURE 3. Manufacturing traces on the investigated obsidian tablets and one experimental specimen, illustrating individual production stages (pecking, grinding, polishing). (a) Leveling of a remaining ridge from knapping by pecking on the back of item NMAI 16/3389; scale bar = 10 mm. (b) Close-up of an individual pecking mark on the back of item NMAI 16/3389; scale bar = 1 mm. (c) Individual pecking marks on the back of item NMAI 00/3155; scale bar = 1 mm. (d) Detail of the edge of object NMAI 00/3155, with raking light revealing uniform grinding traces; scale bar = 10 mm. (e) Microscopic image of uniform edge grinding traces on object NMAI 14/9037 (mahogany tablet) ; scale bar = 1 mm. (f) Experimental grinding of obsidian with a sandstone lapidary wheel; scale bar = 10 mm. (g) Bundles of striations from polishing on the upper side of object NMAI 19/6651; scale bar = 1 mm. (h) Polishing traces on the upper side of object NMAI 14/9037 (mahogany tablet) ; scale bar = 1 mm. (i) Extremely finely polished upper surface of object NMAI 16/3389; scale bar = 1 mm. Microscopically, no polishing traces are visible.

Raw Material Provenance Analyses

Net count ratio data acquired from XRF point spectra for all objects and obsidian reference samples are shown in Table 2. In cases where multiple reference samples from the same obsidian source were measured, the ratios are consistent with each other. Ratios from reference samples were plotted against each other, and 95% reliability ellipses were calculated, shown in the example biplot for Fe/Mn and Rb/Zr in Figure 4. Data points determined from the tablets were plotted and compared to the compositional space occupied by these reference specimen ellipses. Five of the tablets (items 0/92771, 19/6651, 16/3389, 00/5736, and 00/3155) fall within the area defined by the Ucareo source, whereas object 14/9037 falls outside all of the source regions as determined by the geochemical biplots.

Of the five tablets consistent with an Ucareo source assignment, two of the tablets (00/5736 and 00/3155) exhibit some values that lie within the overlap between the Ucareo and Zinapécuaro sources. The Ucareo and Zinapécuaro obsidian sources are spatially close, separated by only ~20 km, but the flows likely originate from two different magmatic events and can be readily distinguished chemically (Healan, 1997, 2009; Pollard, 1993; Pollard et al., 2001; Glascock, 2011). Nelson and Healan (1995) have documented chemical variation across the Ucareo obsidian source, with higher Rb and lower Fe and Zr in the southern part of the erupted lobe relative to other areas in the flow. Although closer to the overlap in the biplots, the mean ratio values for objects 00/5736 and 00/3155 shown in Table 2 are consistent with an Ucareo source. The subtle chemical differences exhibited by the two tablets (00/5736 and 00/3155) relative to the three that fall well within the Ucareo source suggest that the raw material likely came from a different part of the obsidian flow within the Ucareo source, rather than originating from the Zinapécuaro area (Figure 5).

The sixth tablet (14/9037) is made of brecciated mahogany obsidian, with a reddish-brown matrix surrounding black and patchy reddish-brown clasts, and is visually distinct from the other five tablets that source to the Ucareo area. Mahogany (red or meca) obsidian has been detected in a variety of obsidian sources in central and western Mexico (Pollard, 1977; Glascock et al., 1994; Pollard and Vogel, 1994) but was found in greater quantities and quarried at the Otumba source (Clark, 1979; Otis Charlton, 1993). Cerro Zináparo also provided red obsidian within the Purépecha Empire (Figure 5; Pollard, 1977; Rebnegger, 2010:83, 2013:102–115; Walton, 2017). Methods for sourcing mahogany obsidian are identical to those used to geochemically fingerprint a source locality for conventional black obsidian because the color mechanism arises from differences in the iron oxidation state and nanoscale structure (Glascock et al., 1994; Kasztovszky et al., 2018). The mahogany tablet in the NMAI collections is similar in appearance to a square-shaped painting on mahogany obsidian at the University of Missouri Museum of Art and Archaeology, which is thought to originate from the Ucareo source (Pixley, 2012). However, item 14/9037 is not consistent with any of the obsidian sources analyzed in this study, and therefore, its source locality remains unknown.

DISCUSSION: RECTANGULAR, POLISHED OBSIDIAN TABLETS AND INDIGENOUS–COLONIAL INTERSECTIONS

The results of our technomorphological investigations provide clear evidence that the manufacturing process of the obsidian tablets involved expert obsidian knapping skills and the use of colonial lapidary tools, notably the grinding wheel, as attested by

TABLE 2. Mean net count ratios ± 1σ for *n* points across each specimen. The abbreviation BDL (below detection limit) indicates the numerator value was not detected by portable X-ray fluorescence spectrometry.

Sample	*n*	Source	Rb/Zr	Sr/Zr	Y/Zr	Nb/Zr	Fe/Mn
MURR SH1101	4	Pachuca	0.178 ± 0.009	BDL	0.102 ± 0.002	0.104 ± 0.006	18.8 ± 0.2
NMNH 91655	4	Pachuca	0.177 ± 0.001	BDL	0.0957 ± 0.0003	0.108 ± 0.003	18.4 ± 0.1
NMNH 117450-34	4	Pachuca	0.176 ± 0.004	BDL	0.099 ± 0.002	0.112 ± 0.005	18.3 ± 0.1
MURR OM0303	4	Otumba	0.85 ± 0.06	0.91 ± 0.05	0.11 ± 0.05	BDL	30.2 ± 1.1
NMNH 117450-51	10	Zinapécuaro	1.4 ± 0.2	0.05 ± 0.03	0.18 ± 0.03	0.28 ± 0.04	49.8 ± 1.5
MURR UM0607	4	Ucareo	1.14 ± 0.07	0.08 ± 0.02	0.09 ± 0.03	0.27 ± 0.04	55.4 ± 4.2
DH Ucareo	10	Ucareo	1.13 ± 0.06	0.09 ± 0.01	0.14 ± 0.02	0.23 ± 0.02	54.7 ± 2.3
NMAI 09/2771	14		1.13 ± 0.04	0.09 ± 0.01	0.14 ± 0.01	0.24 ± 0.02	55.4 ± 1.8
NMAI 19/6651	12		1.09 ± 0.08	0.10 ± 0.02	0.13 ± 0.02	0.23 ± 0.02	54.6 ± 2.8
NMAI 16/3389	12		1.15 ± 0.05	0.10 ± 0.01	0.14 ± 0.01	0.24 ± 0.02	54.5 ± 2.4
NMAI 00/5736	10		1.24 ± 0.03	0.08 ± 0.01	0.13 ± 0.01	0.25 ± 0.01	52.3 ± 1.6
NMAI 00/3155	10		1.22 ± 0.05	0.10 ± 0.01	0.15 ± 0.01	0.24 ± 0.01	53.2 ± 2.3
NMAI 14/9037	15		1.63 ± 0.03	0.04 ± 0.01	0.22 ± 0.02	0.33 ± 0.02	41.9 ± 1.5

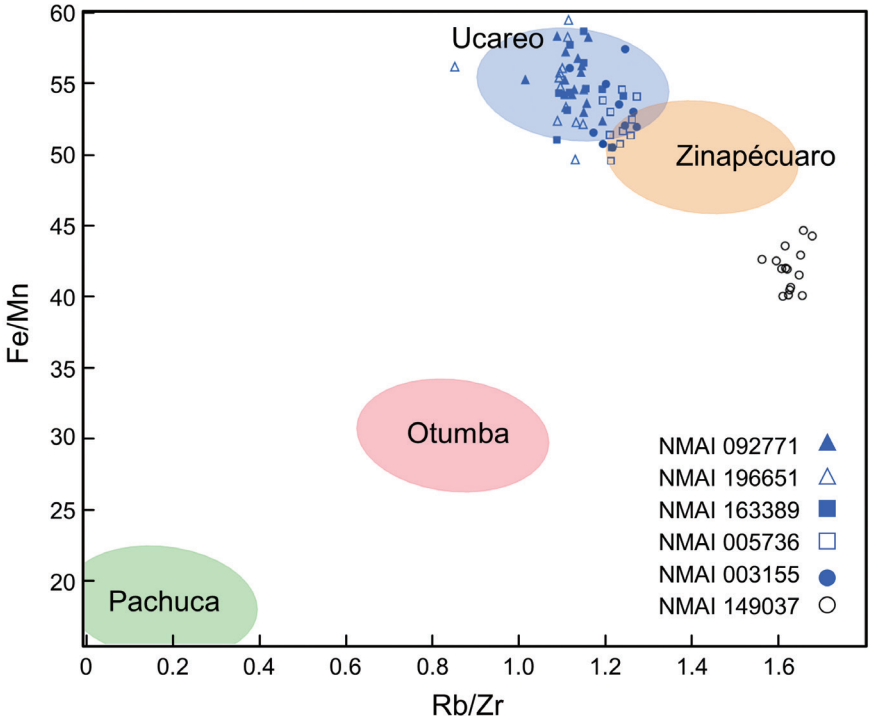

FIGURE 4. Biplot for the XRF net count ratios Fe/Mn and Rb/Zr. The areas within the ellipses represent 95% reliability for each source area. Data points from the obsidian tablets are plotted on the graph, with blue symbols being consistent with the Ucareo source area. Two tablets, NMAI 00/5736 and 00/3155, have values that overlap with the Zinapécuaro source area, whereas one tablet, NMAI 14/9037, does not align with any of the source references studied.

characteristic traces (Figure 3d–f). Therefore, we see Indigenous expertise applying both traditional and colonial tools in the production of such novel products. Thus, we have established direct correlation of manufacturing traces, notably pecking to level all surfaces, between the colonial obsidian tablets and Late Postclassic lapidary objects from the site of Erongarícuaro (see Rebnegger, 2013:102, figs. 5.22, 5.23). Pecking and grinding of faceted surfaces are also attested for polyhedral Ucareo obsidian cores, for example, at the site of Villafuerte, which display patterns strikingly similar to those observed on our study objects (see Healan, 2009). Additionally, museum records lack evidence that rectangular, polished obsidian items have ever been found in secure archaeological contexts, and historical sources and contemporary research indicate that they were used as altars, or *aras*, and canvases for Baroque paintings during the sixteenth and seventeenth centuries. These results unambiguously support the initial supposition that polished, rectangular obsidian tablets at the NMAI are not pre-Columbian and are, instead, more likely objects produced for and consumed by the Spanish for various purposes.

Only very limited studies on the provenance of such objects exist. Particle-induced X-ray emission and XRF analyses have proposed Ucareo, Michoacán State, Mexico, as the main source of the obsidian raw material used to make these colonial specimens (Calligaro et al., 2005, 2007; Pixley, 2012:18). Initially believed to be part of one large undistinguishable source region called Zinapécuaro, more recent research employing XRF analysis was able to distinguish between the three separate sources of Ucareo, Zinapécuaro, and Cruz Negra (Pollard, 1993; Healan, 1997, 2009; Pollard et al., 2001; Glascock, 2011). Although previous studies were not able to achieve a clear source assignment for two obsidian tablets used as canvases by Bartolomé Esteban Murillo (Musée du Louvre) and four blank tablets (Musée de l'Homme) on the basis of particle-induced X-ray emission analyses (Calligaro et al., 2007:47), our provenance studies using pXRF were more successful and agree with another sourcing study of a painted obsidian canvas at the Museum of Art and Archaeology at the University of Missouri (Pixley, 2012).

The raw material provenance analyses conducted for this study demonstrate that five of the six investigated objects originated from the Ucareo source area, and the mahogany (meca or red) obsidian tablet could also belong to this larger geological region, although currently, it is not possible to identify its original source location (see Table 2, Figure 4). Other obsidian sources within the Purépecha realm were also intensively used, for instance the Zináparo-Varal-Prieto source area; therefore, it is of utmost importance to include these geological sources to identify the source of this object. Pollard (1977) and Walton (2017) note that red obsidian was procured from Cerro Zináparo during the Late Postclassic period and distributed to Tzintzuntzan for the production of luxury items (also see Rebnegger, 2010:83, 2013:102–115). The presence of outside sources in smaller quantities, for example, Sierra de La Navajas (Pachuca), Sierra de Pénjamo (present-day Mexican state of Guanajuato), and the highland sources from Jalisco, was also documented by Rebnegger (2010:83, 2013:115). Notably, at Ucareo the occurrence of tabular obsidian was reported by Calligaro et al. (2007), making this source ideally suited for the production of such items. However, the objects from the NMAI were worked to the point that our technomorphological study could not determine whether large nodules or plates were used in their production.

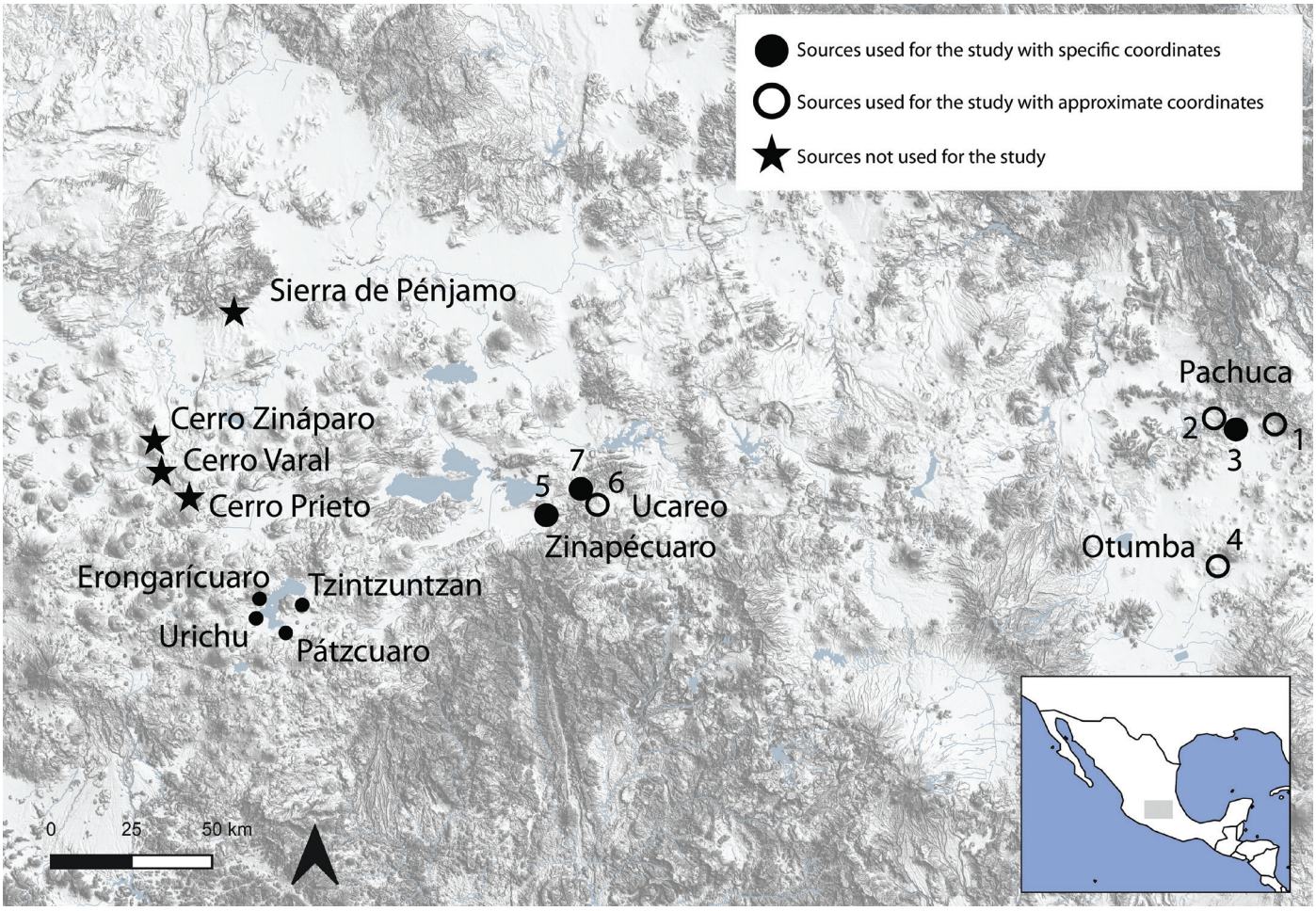

FIGURE 5. Map of central Mexico with Purépecha archaeological sites around Lake Pátzcuaro and obsidian sources in the Purépecha and Aztec Empires. Locations of obsidian reference specimens with specific latitude and longitude coordinates are marked by solid circles, whereas open circles represent approximate locations based on previously published descriptions. Samples 1–3 represent the Sierra de Pachuca source area, sample 4 represents Otumba, sample 5 represents Zinapécuaro, and samples 6 and 7 represent the Ucareo source. Sources indicated by a star were not available for the current study.

As noted earlier, obsidian production shortly before and especially after colonization was fairly localized in its nature. Consequently, having identified the geological source of these objects, we focused our subsequent research agenda on various crafting communities under colonial rule in western central Mexico that heavily relied on Ucareo obsidian for lapidary products: the pre- and postconquest Purépecha Empire.

The Purépecha Empire

From CE 1350 to 1522, the Purépecha Empire ruled a vast territory that included the present-day state of Michoacán and parts of Jalisco and Guanajuato as well as a large number of obsidian sources (Figure 5). The Purépecha people considered obsidian sacred, embodying royal and divine powers, which is apparent from the pre-Hispanic archaeological record (Darras, 1998, 2010) and the historical narrative *Relación de Michoacán* (RM).[5] Using archaeological data, Pollard (2017), Rebnegger (2010, 2013), and Walton (2017) document pre-Hispanic obsidian lapidary in the Purépecha Empire. According to their studies, the production and consumption of obsidian lapidary products, for example, ear flares and labrets, took place at the Lake Pátzcuaro Basin within elite residential areas of primary and secondary administrative centers (Figure 5). These included the king's main residence of Tzintzuntzan and secondary centers with high-ranking elites such as the site of Erongarícuaro (Rebnegger, 2010:80; Pollard, 2017:15; Walton, 2017:101–102). The archaeological data and the RM indicate that items such as ear flares and labrets signify the rank of royalty

and only the king and certain office holders were entitled to wear them (Walton, 2017:101). Rebnegger (2013) notes that during the Tariacuri phase (Late Postclassic, CE 1350–1525) lapidary work at Erongarícuaro also included mirror production. Likewise, Pollard (1977) mentions the presence of obsidian disks at lapidary workshops, and Walton (2017) also documents production of polished disks or cylinders on the Great Platform in Tzintzuntzan during the Late Postclassic (Figure 5). Olivier (2003) cites two historical references that suggest the use of circular mirrors in the Purépecha Empire.

According to the RM ([1541] 1956:171–172), the king may have had skilled craft specialists who lived within the royal family residences at Tzintzuntzan. Archaeological data combined with accounts in the RM led Walton (2017) to assert that lapidarian specialists were lower-level elite males attached to the royal residence. Maldonado (2008:293) documents a similar pattern for precious metal items and also suggests a form of attached specialization during precolonial times. For further discussions on the organization of craft production see Costin (1991, 2005).

Obsidian provenance studies at Tzintzuntzan and Erongarícuaro demonstrate that these centers almost exclusively used obsidian from Ucareo for both utilitarian and lapidary items, indicating that this source was most likely state controlled by the capital during pre-Columbian times (see Pollard et al., 2001; Rebnegger, 2010), but a tributary system of local workers has also been considered (Healan, 1997). It is also likely that Ucareo obsidian remained the main source at primary centers in the Pátzcuaro Basin core during colonial times, even with the disruptions and changes in all trade routes throughout New Spain that occurred shortly after conquest.

Purépecha Artisans and Obsidian Use Under Colonial Rule: Sixteenth and Seventeenth Centuries

Although some metal tools were introduced by the Spanish, obsidian tools remained markedly essential and continued to be made and used by the Indigenous population for their own consumption and for the production of items that supported enslaved Africans and their descendants and local Native slave laborers working in the Spanish mining, cattle, and agricultural industrial complexes (Warren, 1985:172–210; Serrano, 2017:72–73). These items include bulk goods such as chilies, corn, beans, blankets, footgear, mantas, and pottery. For example, the processing of hides from the Spanish cattle industry in central Mexico, including Michoacán (see Endfield, 1997), precipitated the modification of scraper obsidian technology (see Pastrana Cruz et al., 2019:21–23). It is ironic to consider that obsidian played such an important and critical role in the economy that fueled the European Renaissance.

Nonutilitarian polished obsidian items along with other luxury objects were also of great importance to the Spanish. Warren (1985:21) notes that Purépecha art was highly regarded by the Europeans and gifted to the Spanish king by the *Cazonci* (Purépecha king or ruler; see Garcia, 2012:8, 18). Bartolomé de las Casas observed, "The artisans who exceed all others of New Spain in this art are those of the province of Michoacán" (Casas and Pérez de Tudela y Bueso, 1958:208). Therefore, it was of great interest for the invaders to preserve, continue, and/or control the arts and obsidian economy for their own consumption.

It is likely that the highest Purépecha elites, who remained in power after the invasion, maintained control over specialized artisans for producing traditional regalia, for example obsidian and turquoise earspools and labrets. This is attested by an *oficial* of Pátzcuaro, also listed among the nobles of this town, named Pablo Coyote, who indicated in CE1565 that he had been a lapidist of the lord of Ihuatzio in the past (Kuthy-Saenger, 1996:313, Appendix 1). When such items of status and authority were replaced by Spanish status symbols is an important question that remains. For example, the RM, created between CE 1539 and 1541, illustrates the *Cazonci* and other noble elites wearing traditional regalia and status symbols, including labrets. However, the RM was created to show Purépecha society prior to the Spanish invasion, so these images may not represent elite accoutrements during the time of its creation.

According to Kuthy-Saenger (1996:104), by the late sixteenth century the general Native population had already adopted Spanish-style clothing. It is not clear whether this shift in clothing style included the abandonment of all Indigenous elite lapidary status symbols, particularly because these items were considered to embody legitimate authority and noble status (Haskell, 2008:235). However, the highest Purépecha elites and other nobles, most likely a very small number by this time (Gorenstein and Pollard, 1983:54), may have abandoned their traditional regalia faster than the general population, particularly because of their proximity to the Spanish elites and their desire to assimilate to the new elite culture. As Kuthy-Saenger (1996:100) states, "It was the highest-ranking Tarascan elite who adjusted to and associated with the Spanish elite, and, therefore, rapidly adopted the new colonial symbols of status that identified the Spanish conquerors." Therefore, it is reasonable to conclude that shortly after the assassination of the last Purépecha king, Tzintzicha Tangaxoan, in CE 1530 the remaining Purépecha elites ceased using their traditional regalia, including clothing and obsidian lapidary items. This shift forced the lapidists formerly attached to elite households and responsible for the production of these status symbols to adapt to a new reality under Spanish rule soon after CE 1530.

After the execution of the *Cazonci*, Bishop Vasco de Quiroga (CE 1470–1565) was sent by Charles I to Michoacán to end a period of violence and abuse against the Native populations and to restore order from the chaos that had ensued under the tyrannical rule of Nuño de Guzmán (Warren, 1985:138–156; Zarandona, 2006). Vasco de Quiroga served as the first bishop of Michoacán from CE 1536 to 1565 and moved the capital from Tzintzuntzan to Pátzcuaro in 1540. A fundamental legacy of Vasco de Quiroga was the establishment of a "utopian" construction according to Thomas More's ideas in the form of hospital towns and several colleges (Warren, 1999, 2005:83; Gómez, 2001). Indigenous peoples were relocated and consolidated at centralized town locations through the process known as *reducción* (see Deagan, 2003:5).

Within these newly created and repopulated villages, Vasco de Quiroga also called for the revitalization and preservation of traditional crafts (Pérez de Ribas, 1896:103–104; Jarnés, 1942:275–279; Lacas, 1957:82–84).

Specific villages were assigned particular trades, arts, or crafts reflecting the specialty of the locale. Historical accounts list a wide array of crafts, among them woodworking, feather working, and lapidary, in these villages of economic specialization (Lacas, 1957; Dinerman, 1972; Pollard, 2017:15). Along with the introduction of some European tools for making craft production more efficient, Vasco de Quiroga also introduced European arts and played a significant role in the regional craft industry around Lake Pátzcuaro sometime after 1539 (Lacas, 1957:82). These specialized crafting villages and/or wards within the larger centers may have served as the foundations for a system comparable to craft guilds developed by the Spanish (see Pastrana Cruz et al., 2019:21–24, for craft production in colonial Aztec society). Kuthy-Saenger (1996:159–160, 195, 219, 315) documents sixteenth century lapidarians and a number of other craft specialists as *oficiales de oficio* or *anataquareni* from crafting wards in Pátzcuaro.

These developments resulted in the creation of hybrid products combining old and new technologies. Items produced with Indigenous ingenuity, skill, artistry, and materials that were held sacred were transformed into objects with entirely different values and motives of use, for instance, obsidian tablets serving as altars in Catholic churches and obsidian canvases with depictions of Christian iconography from Baroque times. Historical evidence of lower-status elites active as craftspeople (Zurita, [1560–1585] 1840; Kuthy-Saenger, 1996) points toward the most likely producers of high-value objects, such as rectangular, polished obsidian tablets during colonial times: lower elite Purépecha lapidarians most likely under a craft guild system who still held a position of higher status and had knowledge of traditional craftmanship accompanied by colonial technology, for example, the grinding wheel, in the area of Lake Pátzcuaro. The Native artisans could have developed their own niche within this guild system under Spanish control that afforded entrepreneurship to meet the market demands, as Pastrana Cruz et al. (2019) suggest for Aztec artisans.

CONCLUSION

The outcomes of this study highlight the importance of integrated collections-based research utilizing nondestructive analytical techniques and the full breadth of historical sciences to answer complex socioeconomic questions. Additionally, this study developed an anthropological and techno-morphological analytical protocol for collections-based research involving rectangular, polished obsidian tablets from Mesoamerica on a larger scale that can be used by researchers working within and outside museum settings. Through the investigation of manufacturing traces (*chaîne opératoire*), the (ethno)historical records, and precolonial and colonial period iconography and art, we have presented multifaceted evidence that when taken together, the obsidian tablets at the NMAI are most assuredly colonial objects. They were created by Indigenous artisans and primarily used as early as the middle sixteenth to seventeenth centuries by Spanish colonists in Mexico and Europe, and their significance lives on in the twenty-first century within museums settings worldwide.

Our provenance investigations revealed that these tablets, with the exception of the mahogany (meca or red) obsidian specimen, originate from the Ucareo source, although Calligaro et al. (2007) note that one rectangular obsidian tablet at the Musée de l'Homme (MH.78.1.498) originated from the Sierra de Pachuca source. The fact that similar objects (n = 6) housed in museums in Paris, France (Calligaro et al., 2007), and the University of Missouri (n = 1; Pixley, 2012) also originate from the Ucareo source area allows us to identify one of the main production hubs of such objects within the former Purépecha Empire.

Pre-Hispanic archaeological evidence of obsidian at the Purépecha capital, Tzintzuntzan, and the secondary center of Erongarícuaro illustrates a strong obsidian lapidary tradition with artisans attached to royal and elite households. Additionally, this tradition almost exclusively relied upon Ucareo raw material and had limited use of other sources from within and outside the Purépecha territory. Some of the manufacturing techniques at Erongarícuaro and at the Ucareo workshops, for example, Villafuerte, directly correspond to manufacturing techniques attested for all items in this study and previously published rectangular, polished obsidian tablets, notably the pecking on the unpolished surfaces. Tzintzuntzan and the secondary center of Erongarícuaro are also known locations where mirrors and polished disks were manufactured during the Tariacuri phase (Late Postclassic, CE 1350–1525; see Figure 5). Therefore, these are the centers where such crafting knowledge and techniques were already in place and well established when the Purépecha Empire was invaded.

After the conquest, lapidarians remained attached to elite households as long as their skills used in the production of high-status symbols were required by the Native elites. This changed not long after the execution of the last *Cazonci* in 1530. On Vasco de Quiroga's arrival he must have recognized the strong crafting traditions already in practice at the pre-Hispanic primary and secondary centers, and with his plan focusing on specialized skills using locally available raw materials, he had the prime opportunity to reorganize and revitalize specialized crafting communities in the mid-sixteenth century around Lake Pátzcuaro. Thereafter, these artists were organized within a system best comparable to European craft guilds (Kuthy-Saenger, 1996; Pastrana Cruz et al., 2019). This strong historical evidence makes the area around Pátzcuaro and Tzintzuntzan or one of the associated secondary centers the most likely candidate for being the production site of the obsidian tablets under investigation.

Nevertheless, owing to incomplete Spanish documentation and the Purépecha upper nobility's attempt to erase lower elites from this discourse, we cannot with certainty determine the precise village or town where these items were produced (see Pollard, 2005). Notably, we are able to specify that lower Purépecha

elites during the sixteenth and seventeenth centuries (and perhaps beyond) from the Lake Pátzcuaro area were the producers of these objects. Working as craft specialists, although of elite status, within these specialized craft villages must have provided these artisans with a certain amount of autonomy; however, it is unlikely that they were completely independent entrepreneurs.

European colonists appropriated these novel products, consequently misappropriating Native knowledge, artistic skill, and sacred materials, and assimilated them as Christian paraphernalia and as canvases for artistic executions of Baroque period Christian art (see Saunders, 1997, 2001). Other studies have shown that Indigenous materials and technology were not so quickly replaced by European products (see Rodríguez-Alegría, 2005, 2008, 2014); likewise, this study of rectangular, polished obsidian tablets supports the principle that Native craft and technology were highly desired by the Spanish colonizers.

This contribution is an example of research from the museum to the field, so to speak. Archaeologists working in the Lake Pátzcuaro Basin have encountered pre-Columbian lapidary workshops; however, to our knowledge, colonial period workshops—which also must have existed—have not been recognized or published yet. However, because these items lack provenience (Barker, 2012; Joyce, 2012), we cannot determine whether they were excavated or whether these items were acquired directly from the artisans themselves and can be classified as archaeological/ethnographic (see the section "Defining Anthropological Museum Collections" and Table 2 in this volume's Introduction). Although this insight does not change our interpretations, it does change how the museum categorizes, views, and values these items. According to Joyce (2012), we could not trace the provenience of these objects, but we were able to recover and add multiple layers to their provenance that were previously inaccessible. Therefore, this study could serve as an incentive for exploring manufacturing debris from lapidary workshops at colonial period archaeological sites on the basis of the finished products of highly polished obsidian tablets.

Such a study could also elucidate broader patterns of obsidian procurement, use, and distribution, for instance, which obsidian sources were used, what items were manufactured, and by whom and for whom. Finally, the investigation of colonial period lapidary workshops could be used to critically assess the historical sources, for exmaple, the role of Quiroga's utopian system in the revitalization and reorganization of craft production in the Purépecha Empire core. Future studies may be able to determine the use of such obsidian tablets housed in museums worldwide by defining a typology based on their morphological characteristics and to unambiguously determine their function as canvases or altars. Additionally, it would be a beneficial undertaking to include data from all obsidian sources within the Purépecha realm for a large-scale obsidian tablet sourcing study.

Obsidian art continues to be an important economic foundation for Indigenous communities living near obsidian sources in Mexico. As a second component of this project, we would like to consult and build a collaborative partnership with the descendant Purépecha artisan communities in Michoacán (see Colwell-Chanthaphonh et al., 2010; Silliman and Ferguson, 2011; Atalay, 2012, 2020; Gonzalez, 2016; Burgio-Ericson and Seowtewa, this volume; Norman et al., this volume). Many Native communities are unaware of the vast amounts of their community belongings that are currently housed in museums and private collections worldwide, particularly when they remain completely anonymous in museum records (also see Berger et al., this volume). The incorporation of Indigenous oral tradition is critical for archaeological practice (Lightfoot, 1995; Echo-Hawk, 2000). With our current undertaking in collections-based research, we are contributing to the restoration of ancestral intellectual knowledge and labor to the Purépecha peoples that were erased through the process of coloniality, including museum practices of the the nineteenth and twentieth centuries.

NOTES

1. We used primary and secondary historical sources. It is necessary to consider all the problems inherent in relying on ethnohistorical sources, both primary and secondary. Colonial and other institutional documents must be critically interrogated for prejudices and misapprehensions about Indigenous beliefs and practices and must be placed within the context of colonialism, capitalist expansion, evangelization, and Indigenous and nationalist social movements (Strong, 2015:7–10). For example, the *Relación de Michoacán* represents a mythical narrative and is based on a reiteration of history "that was brutally interrupted by the Spanish" (Darras, 2014:49). Additionally, these sources are incomplete, idealized, and urban oriented (Otis Charlton, 1993:231). We have also encountered researchers omitting words in their Spanish to English translations, a separate issue that needs to be addressed.
2. The Purépecha Empire is also called the Tarascan Empire, the name given to them by the Spanish (see Warren, 1985:6–10), and is also known as the Kingdom of Tzintzuntzan (Iréchecua Tzintzuntzani). Tarascans spoke Purépecha and formed a state that later became a multilingual empire, where Purépecha was the dominant language. Today, the name "Purépecha" is the name with which contemporary people from Michoacán identify. From this point forward we will address this empire and its people as the Purépecha for pre- and postconquest times.
3. Although there were multiple and culturally diverse city-states in the Valley of Mexico during the Late Postclassic, we use the term "Aztec" when considering the Indigenous people who resided in and governed this region and spoke Nahuatl for pre- and postconquest times. Although we would like to address these peoples by their Indigenous name, these names tend to be exclusionary and circumscribed to very specific geographical locations. Smith (2012) refers to the people of the Valley of Mexico and nearby highland valleys as Aztec during preconquest times and as Nahuas postconquest.
4. See the Maya Vase Database (Kerr, 2006) at http://research.mayavase.com/kerrmaya.html, for example, Kerr numbers 625, 764, 787, 1453, 1790, 3203, and 4096.
5. The RM (Relación de Michoacán [1541] 1956) is the oldest illustrated manuscript chronicling pre- and post-Spanish contact Purépecha and was composed between 1539 and 1541 under the auspices of the Franciscan Jerónimo de Alcalá in collaboration with Indigenous scribes, authors, and witnesses (Nesvig, 2018:22). The precontact archaeological record is now often used to refine and deconstruct the narrative disseminated by the RM by providing a deeper insight into the social, political, and economic complexities of the Purépecha Empire (see Darras, 1998, 2014; Maldonado, 2008; Pollard, 2017).

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